Detailed Claim Listing

The following is a detailed listing of all claims that are, or were, pending in the present application.

Claims 1-23 (canceled)

24. (previously presented) A composition comprising:

a) a substrate with a surface comprising discrete sites at a density of at least 100 discrete sites per 1 mm^2, said discrete sites comprising wells; and

b) a population of microspheres randomly distributed in said wells, said population comprising at least a first and a second subpopulation, said microspheres comprising a bioactive agent, and wherein said sites can have only a single microsphere.

25. (previously presented) A composition comprising:

a) a substrate with a patterned surface comprising discrete sites, said substrate comprising discrete sites at a density of at least 100 discrete sites per 1 mm^2 ; and

b) a population of microspheres, randomly distributed on said sites, wherein each microsphere comprises a bioactive agent; and

wherein said sites can have only a single microsphere.

26. (previously presented) A composition according to claim 24 or 25 wherein said substrate is a fiber optic bundle.

27. (previously presented) A composition according to claim 24 or 25 wherein said substrate is selected from the group consisting of glass and plastic.

28. (previously presented) A composition according to claim 24 wherein said population of microspheres comprises at least a first and a second subpopulation, wherein the microspheres of said first subpopulation of microspheres are a different size than the microspheres of said second subpopulation.

29. (previously presented) A composition according to claim 24 or 25 wherein said bioactive agent comprises a protein.

30. (previously presented) A composition according to claim 29 wherein said protein is selected from the group consisting of enzymes and antibodies.

31. (previously presented) A composition according to claim 24 or 25 wherein said bioactive agent is a nucleic acid.

32. (previously presented) A composition according to claim 66, wherein the microspheres of said first subpopulation of microspheres are a different size than the microspheres of said second subpopulation.

33. (previously presented) A composition according to claim 24, 66, 28, or 32 wherein said first and said second subpopulations comprise a first and a second bioactive agent, respectively.

34. (previously presented) The composition according to claim 33, wherein said first and second subpopulations further comprise a first and a second optical signature, respectively.

35. (previously presented) A composition according to claim 34 wherein said at least one of said optical signatures comprises at least one chromophore.

36. (previously presented) A composition according to claim 34 wherein said at least one of said optical signatures comprises at least one fluorescent dye.

37. (previously presented) A composition according to claim 36 wherein said fluorescent dye is entrapped within said microspheres.

38. (previously presented) A composition according to claim 36 wherein said fluorescent dye is attached to said microspheres.

39. (previously presented) A composition according to claim 34 wherein said optical signature comprises at least two fluorescent dyes.

40. (previously presented) A composition according to claim 66 wherein said bioactive agent comprises a protein.

41. (previously presented) A composition according to claim 40 wherein said protein is selected from the group consisting of enzymes and antibodies.

42. (previously presented) A composition according to claim 66 wherein said bioactive agent is a nucleic acid.

43. (previously presented) A composition according to claim 24 or 25 wherein said bead is covalently associated with the well.

44. (previously presented) A composition according to claim 24 or 25 wherein said bead is non-covalently associated with the well.

45. (previously presented) A method of determining the presence of at least a first and second target analyte in a sample comprising:

a) contacting said sample with a composition comprising:

i) a substrate with a patterned surface comprising discrete sites; and

ii) a population of microspheres comprising at least a first and a second subpopulation, wherein said first subpopulation comprises a first bioactive agent and said second subpopulation comprises a second bioactive agent,

wherein said microspheres are randomly distributed on said surface such that said discrete sites contain only one microsphere; and

b) determining the presence of said first and second target analyte.

46. (previously presented) A method according to claim 45 wherein said substrate is a optical fiber bundle and said microspheres are located within wells at a first terminal end of said bundle.

47. (previously presented) A method according to claim 45 further comprising identifying the location of said first and second bioactive agent on said substrate.

48. (previously presented) The method according to claim 45, wherein said discrete sites are wells.

49. (previously presented) The method according to claim 45, wherein said substrate is selected from the group consisting of glass and plastic.

50. (previously presented) A method of making a composition comprising:

a) providing a patterned surface comprising individual sites on a substrate;

b) randomly distributing microspheres on said surface such that said individual sites contain microspheres, wherein said sites can have only a single microsphere, and wherein said microspheres comprise at least a first and a second subpopulation comprising:

i) a first and second bioactive agent, respectively; and

ii) a first and second optical signature, respectively;

c) detecting said first and second optical signatures while said microspheres are distributed on said surface; and

d) correlating the location of at least one individual site on the array with the bioactive agent at that particular site.

51. (previously presented) A method according to claim 50, wherein said distributing comprises serially adding said subpopulations to said sites.

52. (previously presented) A method according to claim 50, wherein said substrate is a fiber optic bundle.

53. (previously presented) A method according to claim 50, wherein said substrate is selected from the group consisting of glass and plastic.

54. (previously presented) A method according to claim 50, wherein said sites are wells.

55. (previously presented) A method according to claim 45 or 50, wherein said bead is covalently attached to the well.

56. (previously presented) A method according to claim 45 or 50, wherein said bead is non-covalently attached to the well.

57. (previously presented) A method according to claim 45 or 50, wherein said bioactive agent is a nucleic acid.

58. (previously presented) A composition according to claim 27 wherein said substrate is glass.

59. (previously presented) A composition according to claim 27 wherein said substrate is plastic.

60. (previously presented) A composition according to claim 30 wherein said protein is an enzyme.

61. (previously presented) A composition according to claim 30 wherein said protein is an antibody.

62. (previously presented) A composition according to claim 41 wherein said protein is an enzyme.

63. (previously presented) A composition according to claim 41 wherein said protein is an antibody.

64. (previously presented) A method according to claim 49 or 53 wherein said substrate is glass.

65. (previously presented) A method according to claim 49 or 53 wherein said substrate is plastic.

66. (previously presented) A composition according to claim 25, wherein said population of microspheres comprises at least a first and a second subpopulation.

67. (previously presented) A method according to claim 45 or 50 when said bioactive agent is a protein.